XC74WL4053SR

CMOS Logic

■GENERAL DESCRIPTION

XC74WL4053SR is 2-channel analog multiplexer / demultiplexer manufactured using silicon gate CMOS processes. The small supply current, which is one of the features of the CMOS logic, gives way to high speed operations which enables LS-TTL.
With wave forming buffers connected internally, stabilized output can be achieved as the series offers high noise immunity.
As the series is integrated into a mini molded, MSOP-8B package, high density mounting is possible.

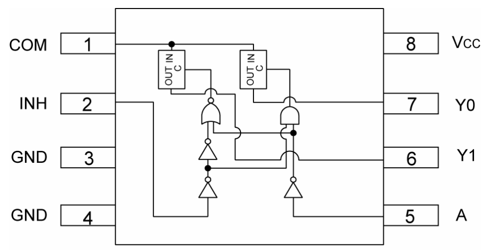
■APPLICATIONS

- ●Palmtops
- ●Digital equipment

■FEATURES

High Speed Operations : tpd = 1.5ns (TYP.) (VCC=5V)
Operating Voltage Range : 2V ~ 5.5V
Low ON Resistance : RON = 12Ω (TYP.)
Low Power Consumption: 2μA (MAX.)@Ta=25℃
CMOS Logic 2-channel Analog Multiplexer/Demultiplexer
Small Package : MSOP-8B

■PIN CONFIGURATION



MSOP-8B
(TOP VIEW)

■FUNCTIONS

CONTROL INPUT		ON CHANNEL
INH	A	
H	X	NONE
L	H	Y1
L	L	Y0

H=High level
L=Low level
X=Don't care

■ABSOLUTE MAXIMUM RATINGS

Ta=-40℃~85℃

PARAMETER	SYMBOL	RATINGS	UNITS
Supply Voltage	VCC	-0.5~+6.0	V
Control Input Voltage	VCONT	-0.5~+6.0	V
Switch Input/Output Voltage	Vi/o	-0.5~VCC+0.5	V
Control Input Diode Current	IIK	-20	mA
Switch Output Diode Current	IOK	±20	mA
Switch Input/Output Current	Ii/O	±25	mA
VCC,GND Current	ICC,IGND	±50	mA
Power Dissipation (Ta = 25℃)	Pd	300	mW
Storage Temperature Range	Tstg	-65~+150	℃

Note: Voltage is all ground standardized

■RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	CONDITIONS	UNITS
Supply Voltage	V_{CC}	2~5.5	V
Control Input Voltage	V_{CONT}	0~5.5	V
Switch Input/Output Voltage	$V_{i/o}$	0~VCC	V
Operating Temperature Range	Topr	-40~+85	℃
Input Rise and Fall Time	tr,tf	0~200（VCC=3.3V）	ns
		0~100（VCC=5V）	

■DC ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	CONDITIONS		Ta=25℃			Ta=-40℃~85℃		UNITS
		V_{CC}(V)		MIN.	TYP.	MAX.	MIN.	MAX.	
High Level Control Input Voltage	V_{IH}	2.0		1.50	—	—	1.50	—	V
		3.0		2.10	—	—	2.10	—	
		5.5		3.85	—	—	3.85	—	
Low Level Control Input Voltage	V_{IL}	2.0		—	—	0.50	—	0.50	V
		3.0		—	—	0.90	—	0.90	
		5.5		—	—	1.65	—	1.65	
Peak ON Resistance	R_{ONmax}	2.0	$V_{INH}=V_{IL}$	—	130	350	—	550	Ω
		3.0	$V_{COM}=0\sim V_{CC}$	—	22	50	—	65	
		4.5	I_{COM}=1mA	—	12	25	—	35	
ON Resistance	$R_{ON}(1)$	2.0	$V_{INH}=V_{IL}$	—	23	50	—	65	Ω
		3.0	V_{COM}=GND OR V_{CC}	—	14	30	—	40	
		4.5	I_{COM}=1mA	—	10	20	—	25	
Switch ON Resistance Differential	ΔR_{ON}	2.0	$V_{INH}=V_{IL}$	—	13	35	—	55	Ω
		3.0	$V_{COM}=0\sim V_{CC}$	—	3	6	—	8	
		4.5	I_{COM}=1mA	—	2	4	—	6	
Power Off Leak Current	I_S(OFF)	5.5	$V_{INH}=V_{IH}$, $V_{OM}=V_{CC}$, V_Y=GND	—		±0.1	—	±0.1	μA
Power On Leak Current	I_S(ON)	5.5	$V_{INH}=V_{IL}$, $V_{COM}=V_{CC}$, or GND	—	—	±0.1	—	±0.1	μA
Control Input Current	I_{INH}	0~5.5	$V_{COM}=V_{CC}$ or GND	—	—	±0.1	—	±0.1	μA
Static Supply Current	I_{CC}	5.5	$V_{COM}=V_{CC}$ or GND	—	—	2.0	—	20.2	μA

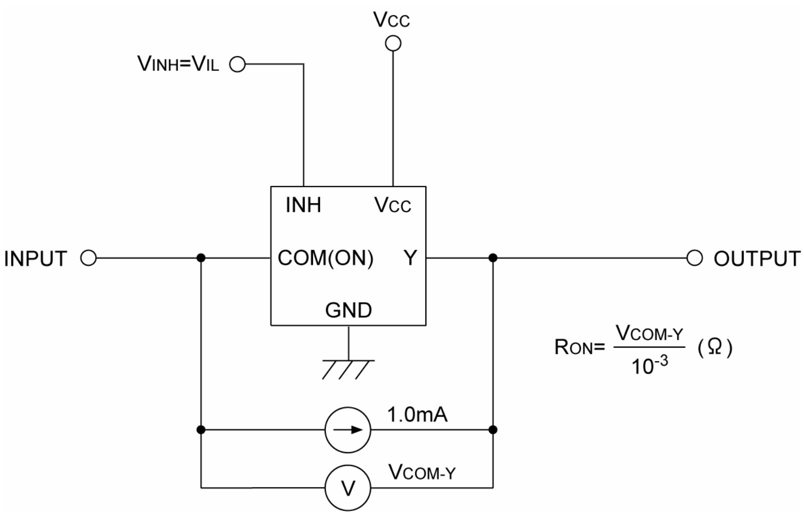
■SWITCHING ELECTRICAL CHARACTERISTICS

(tr=tf=3ns)

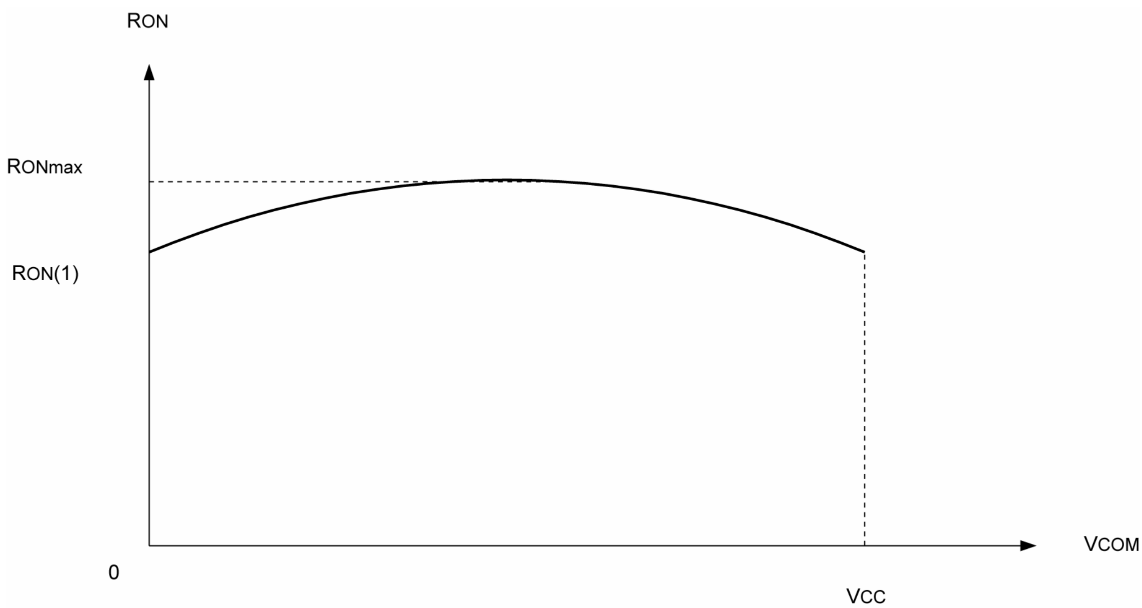
PARAMETER	SYMBOL	CONDITIONS			Ta=25℃			Ta=-40℃~85℃		UNITS
		C_L	V_{CC}(V)		MIN.	TYP.	MAX.	MIN.	MAX.	
Delay Time	t_{PLH} t_{PHL}	15pF	2.0		—	2.5	12.0	—	15.0	ns
			3.3		—	2.0	4.0	—	5.5	
			5.0		—	1.5	3.0	—	4.0	
		50pF	2.0		—	4.0	20.0	—	23	ns
			3.3		—	3.0	6.0	—	8.0	
			5.0		—	2.0	5.0	—	6.0	
Output Enable Time	t_{ZL} t_{ZH}	15pF	2.0	R_L=1kΩ	—	8.5	45.0	—	60.0	ns
			3.3		—	4.5	9.0	—	11.0	
			5.0		—	3.5	7.5	—	9.0	
		50pF	2.0	R_L=1kΩ	—	9.0	50.0	—	65.0	ns
			3.3		—	5.0	10.0	—	12.0	
			5.0		—	4.0	8.5	—	10.0	
Output Disable Time	t_{LZ} t_{HZ}	15pF	2.0	R_L=1kΩ	—	9.0	45.0	—	55.0	ns
			3.3		—	7.0	17.0	—	20.0	
			5.0		—	6.0	14.0	—	18.0	
		50pF	2.0	R_L=10kΩ	—	12	60.0	—	75.0	ns
			3.3		—	10	23.0	—	27.0	
			5.0		—	8.0	20.0	—	25.0	
Sine Wave Distortion Rate		50pF	3.0	R_L=1kΩ f_{COM}=1kHz	—	0.05	—	—	—	%
-3dB Band Width		50pF	3.0	R_L=600kΩ $20\log 10 \frac{V_Y}{V_{COM}}$=-3dB	—	200	—	—	—	MHz
Feed Through (Switch off)		50pF	3.0	R_L=600kΩ	—	-60	—	—	—	dB
Cross Talk (Control Switches)		50pF	2.0	R_L=600kΩ f_{INH}=1MHz	—	60	—	—	—	mV
			3.0		—	100	—	—	—	
			4.5		—	150	—	—	—	
Cross Talk (Between Switches)		50pF	2.0	R_L=600kΩ f_{COM}=1kHz	—	-60	—	—	—	dB
			3.0		—	-60	—	—	—	
			4.5		—	-60	—	—	—	
Control Input Capacitance	C_{INH}	—	—		—	5	10	—	10	pF
Switch Input/Output Capacitance	$C_{OM/Y}$	—	—		—	6	—	—	—	pF
Feed Through Capacitance	$C_{OM/Y}$	—	—		—	0.5	—	—	—	pF
Power Dissipation Capacitance	Cpd	—	—		—	13	—	—	—	pF

■ON RESISTANCE

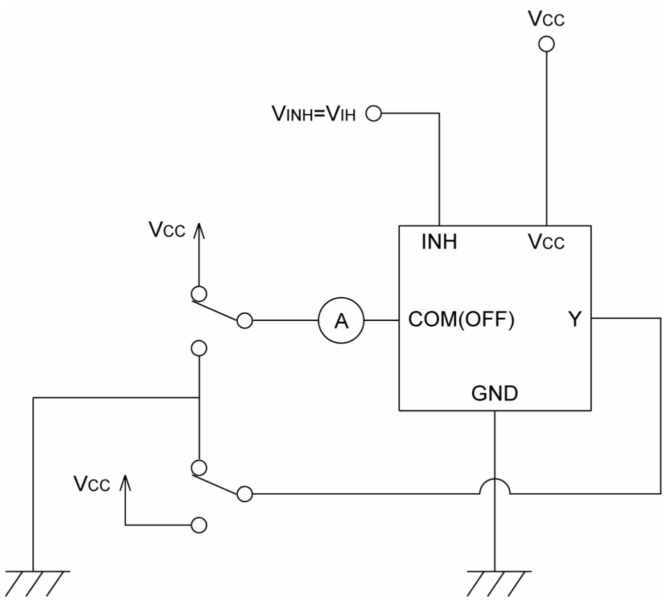
●Test Circuit



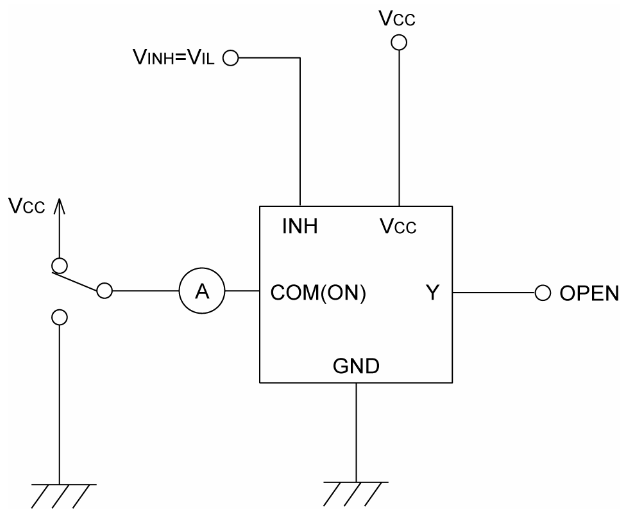
●Input Voltage Dependancies of ON Resistance



■POWER OFF LEAK CURRENT

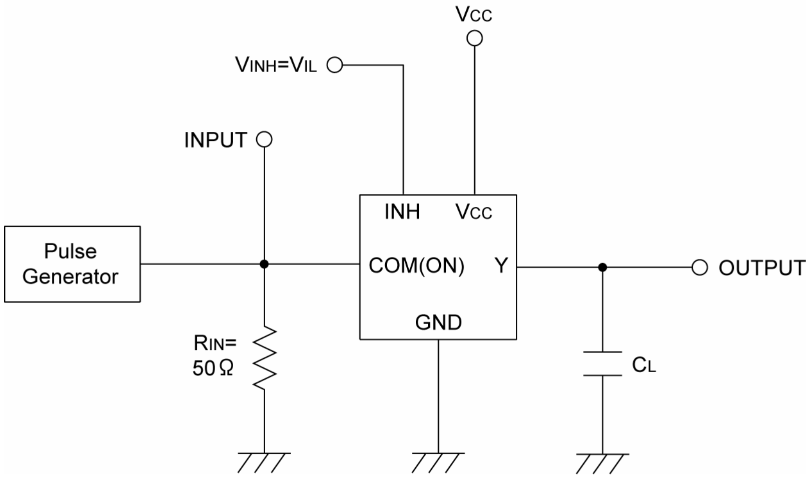


■POWER ON LEAK CURRENT

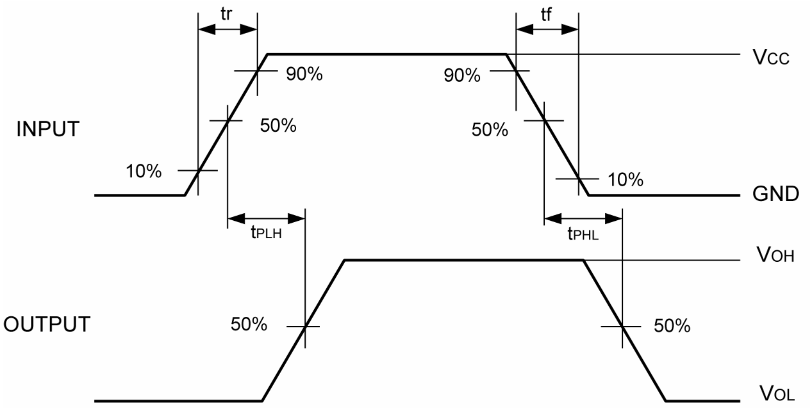


■DELAY TIME

●Test Circuit



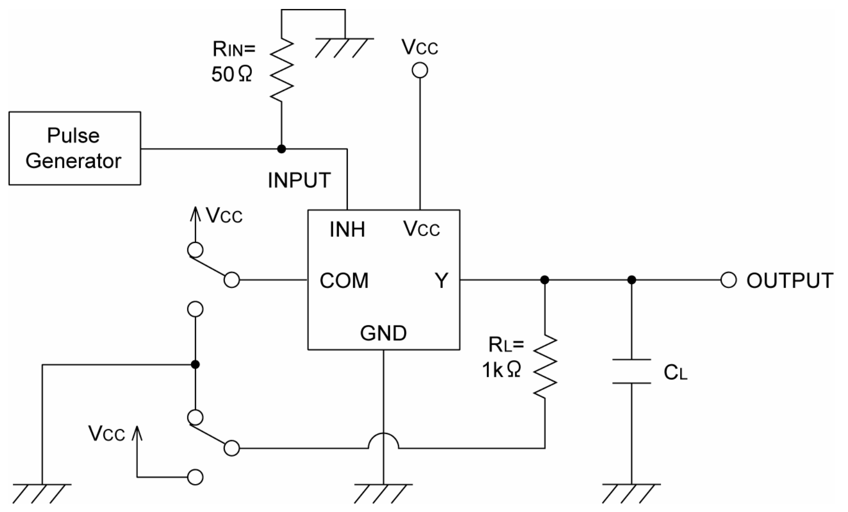
●Waveform



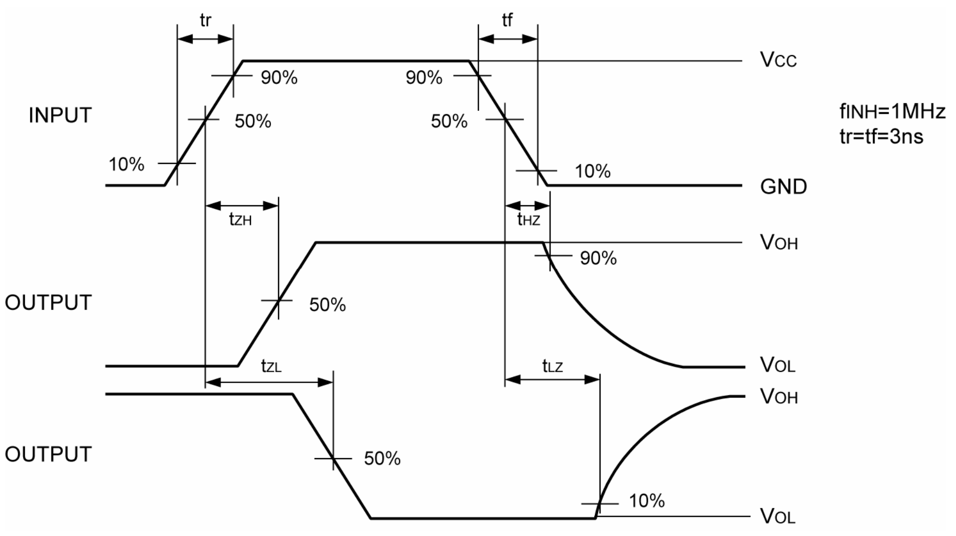
fCOM=1MHz
tr=tf=3ns

■OUTPUT ENABLE TIME, OUTPUT DISABLE TIME

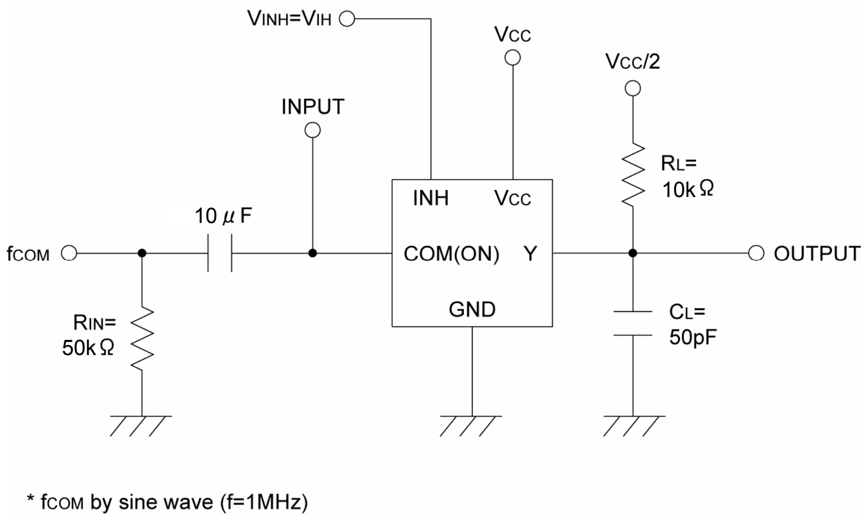
●Test Circuit



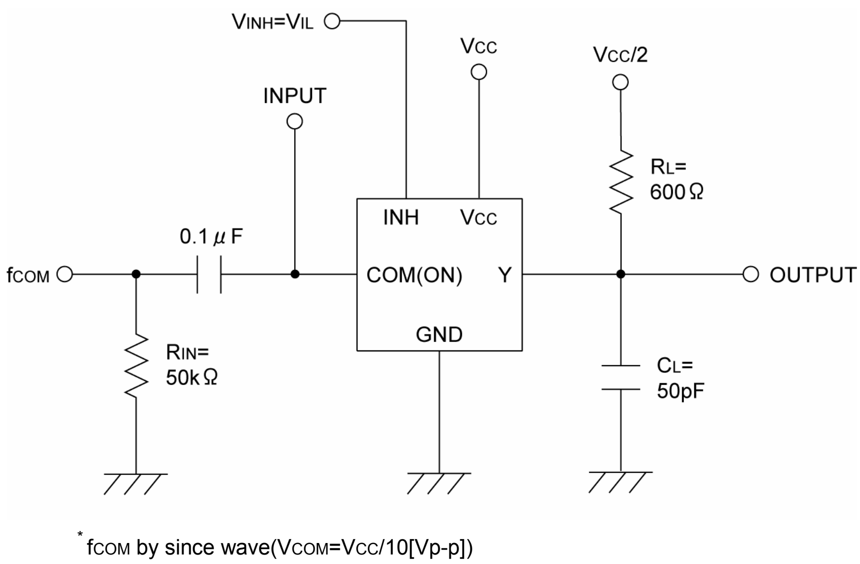
●Waveform



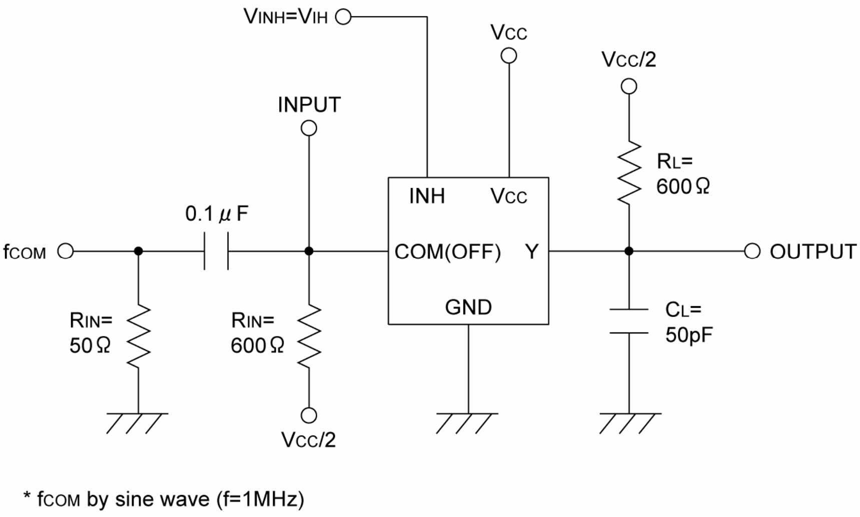
■SINE WAVE DISTORTION RATE



■-3dB BAND WIDTH

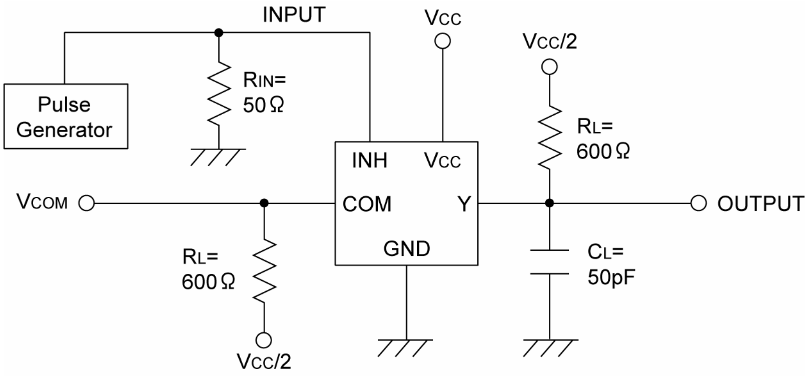


■FEED THROUGH TEST CICUIT

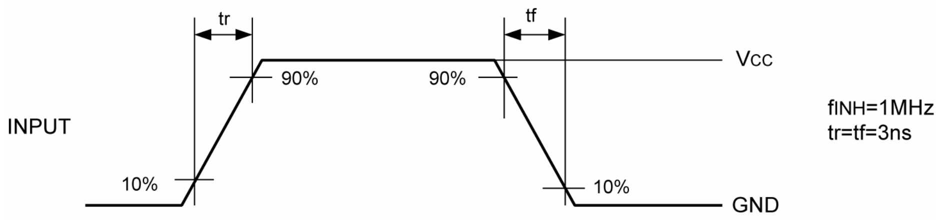


■CROSS TALK (CONTROL INPUT → SWITCH OUTPUT)

●Test Circuit

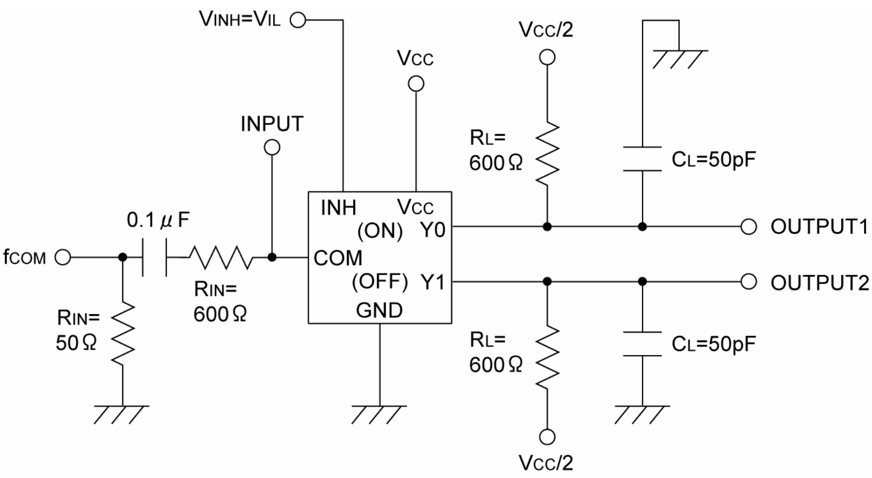


●Waveform



■CROSS TALK (BETWEEN SWITCHES)

●Test Circuit



●Waveform

